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Leon Jonker and Gill Marshall discuss best practice for the presentation of research data in a poster format.



Presenting posters

Introduction

These days, poster presentations, whether electronic or paper, are an integral part of a scientific conference, having been introduced into the arena in the 1970s. They allow researchers to showcase and discuss their work with their peers and, at some events, offer an alternative if an abstract for a proffered paper is not accepted because the organisers may offer the submitter the chance to present a poster instead.

Perhaps in the eyes of some cynics, posters are a way for conference organisers to attract delegates and likewise make a good reason for scientists to justify their attendance. However, if a poster is well designed, well presented, and with good content, a lot is to be gained from the process. For budding scientists, it offers the first steps towards presenting their work in a less intimidating setting than a conference delivery of a paper. Perhaps most importantly, a poster presentation can potentially lead to productive collaborations and development into a peer-reviewed paper.

When, where and why?

Radiology readily lends itself to posters because it is image based and a very visual speciality, so the first step for radiographers is to find out when and where any appropriate meetings are taking place. This could be either a

specialist radiography meeting which focuses on a modality, eg. British Medical Ultrasound Society (BMUS), or a broader conference where a specific conference theme sits easily with the work about to be prepared for presentation.

Calls for abstracts are issued by the organisers of scientific meetings, eg. UK Radiological Congress, European Congress of Radiologists or Radiological Society of North America, usually months in advance, and are often published in the relevant peer reviewed journals. Accepted abstracts may be of completed work or work in progress; those for the latter tend to have a later closing date than that for completed work. Writing the abstract is a process that has its own do's and don'ts, as explained by Marshall in a previous article¹.

The first priority when considering submitting an abstract for a poster is what the actual content will be. This could be the presentation of an interesting case study, or shared work in progress, or a dissemination of a completed project prior to publication in written form. Whatever you choose, you do need to consider whether you have the permission of the patient(s) to publish the data or if there is sensitive data that should not be shared at this point?

Because posters are very much a summary of the research in which people are involved, it is

sometimes worth considering presenting part of a project. Particularly at large national and international events there may be hundreds of posters presented, and using a poster to dissect a theory right down to the smallest detail should be avoided at all costs. It has to strike the right balance between being catchy and informative, and should be legible from one to two metres.

One section of the submitted abstract that will usually make it on to the poster is the title. Titles are also often used by conference attendees to scan through the list of presentations in the programme to identify any posters that may be of interest to them. Therefore, the key is to think of a catchy title that encompasses the essence of the research study². Refraining from using acronyms and abbreviations certainly helps, as does keeping the title short and fairly general. In this manner, more people will be inclined to find out more and visit a poster. It also has the added benefit of leaving room for manoeuvre should the actual content of the poster still be 'work in progress'.

Attention to detail

Once an abstract has been accepted, work on the poster can start in earnest. Never leave the preparation to the last minute – planning is required due to the writing, formatting and production work

involved. Once the content has been written and the poster designed, someone else should read it to check for spelling and grammar mistakes, and to see if there are any design issues, and plenty of time should also be allowed for printing.

The standard size for a poster is A0 (841 x 1189mm), but this should be checked with the instructions issued by the organisers) and although it can seem a bit daunting to produce such a large poster, the end result is often worth the effort.

Whilst a poster has a large surface area, space is limited, as is time for the people who will read it. To make it aesthetically pleasing and easy to read, it should have a generous border around the text and plenty of space between sentences and sections. Never have more than ten lines of continuous text and limit yourself to a maximum of eight illustrative images/figures – remember that a picture paints a 1000 words. Remember also that it should be clear to the reader whether to read across the poster or whether the contents are organised in two or three columns.

The layout follows a similar pattern to any other research publication (bar the abstract which is omitted so as to avoid having a summary in what is essentially already a summary of a research project), with a title,

introduction, aims or objectives, methods, results, discussion, conclusion and finally the quoted literature and acknowledgements.

When writing the content, consider the audience. This will determine the degree of depth that can be applied and the writing style. Although not covered in this article, guidance on reviewing literature when preparing (an abstract) for a poster presentation and writing introductions, methods, results and discussion sections is given in other articles by Marshall^{3,4,5,6}. Bullet points help to highlight important sentences, although this impact will completely disappear if they are used everywhere. The conclusions section is a prime candidate for the use of bullet points, while the methods section can probably do without them.

Because there is the need to condense the content, and for optimal visual impact, if something can be expressed as a graph, table or image, as opposed to text, it is probably better to opt for this. Avoid 3-D bar charts because it is harder for the viewer to establish accurate values from them. Ensure that graphs have labelled axes, and check that all figures, charts and tables have a legend and are numbered sequentially, often with tables being numbered sequentially separately to figures and images^{7,8}.

Choosing the right font will aid in guiding the reader through the poster. The headers tend to be written in sans-serif font (eg, Arial), whereas the body text is usually written in serif font (eg, Times New Roman). The font size for body text tends to be at least 24 points and larger still for headers⁹. More hints and tips on formatting a poster correctly are shown in the sample poster presentation in figure 1.

It can be tempting to be creative and choose quirky colours when designing a poster, but any temptation should be resisted. Stick to a maximum of four colours, and bear in mind that matt finishes are better for images than gloss. The text is best left in black or a dark colour like navy blue or racing green. Bold background colours make it harder to read the text and also forces any images to have a border. Sticking with a white background, or at the most a light pastel colour, is likely to give the best results because it will exhibit good contrast^{10,11}. Also avoid

EXEMPLAR POSTER PRESENTATION WITH CONCISE TITLE

Names of authors, department and institution

Introduction

- Use serif font for the body texts and ensure the font size is legible from approximately 2m distance
- Keep length of introduction to a minimum and quote only the main work that preceded this project

Objectives

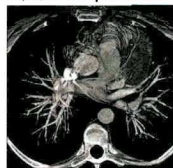
Try to outline the aims of the project in one single sentence

Methods

- Condense the description of methodology applied
- Consider combining methods and results if it concerns a methodology project
- For imaging studies, mention the type and model of the machine used

Results

Visuals, including images, graphs and charts, have more impact than text



Always include legends with any figures or tables

Subheadings improve layout

Avoid applying too many bullet points, using too many acronyms and leave plenty of border around the text.



The layout of a poster can vary depending on the type of research and audience

Conclusions

- Interpret the results, yet avoid listing them again
- Relate findings to current knowledge
- Briefly discuss the implications of the results

References

Key literature only, or e.g. weblinks

Acknowledgements

Sponsor of project and main contributors
Date poster presented

Figure 1: Standard poster design containing various hints and tips.

Checklist

Before getting started on the poster

- ✓ Identify appropriate conferences or scientific meetings
- ✓ Write and submit an abstract
- ✓ Carefully think about the title of the abstract/poster – try to make it attractive to a wide audience and avoid acronyms and abbreviations

The poster content design

- ✓ Divide the poster content into the same sections as the abstract
- ✓ Keep the text short, use bullet points appropriately
- ✓ Methods should not be explained in detail unless it is the focus of the poster
- ✓ Results are better presented in a graph, chart or as an image; do not duplicate what is in these in written format, there is no need and space is at a premium

The poster design

- ✓ Take care to make the font size large enough
- ✓ Avoid background colours that clash with the text colour; opt for white to very light colours instead
- ✓ Ensure that images are formatted correctly to minimise risk of pixellation and printing artefacts.
- ✓ Personalisation is encouraged as long as it does not interfere with the scientific message
- ✓ Do not have more than ten lines continuous text
- ✓ Limit yourself to four colours maximum
- ✓ Limit yourself to eight images maximum

Presenting the poster

- ✓ Take measures to make sure the poster arrives at destination
- ✓ A positive and friendly attitude will attract visitors
- ✓ A poster session offers a great opportunity to network
- ✓ Posters can be used beyond one single conference

presenting text over a background with an embedded image, eg, of a MRI scanner, because this generally reduces the contrast in certain areas of the poster.

In radiography, images of CT, MRI and ultrasound scans are likely to feature on a poster. This is an advantage because it improves the visual appeal of the poster, but there are some technical caveats associated with including graphics on your poster. One thing to bear in mind with images of any kind is to ensure pixellation does not occur. The resolution of an image should be high enough to allow enlargement (300 dpi), and it is also advisable to check the setting of colour images – it should be printer-specific CMYK (cyan, magenta, yellow, black), not screen-specific RGB (red, green, blue)¹².

Asking assistance from someone with experience in working with software that can deal with this kind of work, such as Adobe Illustrator, InDesign, Photoshop, QuarkXpress or Coreldrawer, is highly recommended. The final poster can be formatted as a PowerPoint presentation, but for a proper professional look, it is best to have single sheet poster printed by a professional.

Thus far, the design of a poster appears to be quite a rigid process without any room for personalisation. This is certainly not the case. As Erren and Bourne highlight in their article on poster presentations, it is probably the only scientific communication medium in which *someone's personality can shine through*¹. For example, using a photo of a local landmark near the presenter's workplace may act as an icebreaker. However, whilst being informal is encouraged, it should not overpower the scientific message.

Increasingly, electronic posters are required by conference organisers, eg, European Congress of Radiology, European Society of MR in Medicine and Biology, and International Society of Magnetic Resonance in Medicine. In this case, your content is loaded onto a template supplied by the conference organisers and is viewed electronically at the conference. The advantage of electronic posters is that relevant files can be linked to the poster, eg, sound files, sequences of dynamic images, web links.

The actual presentation

Once the poster has been received back from the printer, the trick is to keep hold of it. This is particularly true when visiting an overseas conference: it is best to take it on a plane as hand luggage, or if this is not allowed, an alternative is to send the poster to its destination by courier. Take some spare tape, post-it notes and pushpins in case anything goes wrong or needs amending, and it is also valuable to have paper copies of key research papers and A4 format copies of the poster itself. This will save attendees from having to make notes themselves and serves as a business card if contact details are included.

Although it sounds obvious, the presenter has to ensure to come across as friendly, approachable and attentive during the poster session. Likewise, it does not help when presenters are away from their poster, standing with their hands in their pockets, or frantically chewing on gum.

People should be allowed to read the poster at their own pace and the presenter should be ready to answer any questions or to talk someone through the contents of the poster should they request this (you may also have to answer judges' questions if there are prizes for the best poster presentations). It is certainly not advised to forcefully approach people who show an interest in the poster; neither is acting too defensively or aggressively when someone is critical of the presented work. It is important to try and take in and memorise both positive and negative feedback and to use this for improving the research design or methodology, or incorporating it in the manuscript that will follow.

The latter appears to be an issue that may need addressing. A small-scale survey of publication rates of research by medics that had previously been presented in poster format showed that only one-third made it into a peer-reviewed journal¹³. Because posters are not necessarily peer-reviewed, it is important for researchers to try and

Accreditation by
cpd now
the College of Radiographers

Test Yourself

Below are some questions for you to answer which you can then count towards your CPD. Note down your answers and any other observations and put them in your CPD folder. If you record this activity in CPD Now, remember that you can scan your paperwork and attach it electronically to your CPD record. The answers will be available online from 1 July, under 'Synergy resources', at: <http://www.sor.org/members/>

1. Who tends to present work in poster format?
2. What is the key difference between a poster and a written article?
3. What size is a typical poster?
4. What aspect of a submitted abstract will normally make it on to the poster?
5. What should be considered when choosing the colours for a poster?
6. Do posters contain an abstract?
7. How should figures for posters be prepared?

To comment on this article, or offer your own experiences of presenting a poster, write to Rachel Deeson at racheld@synergymagazine.co.uk

References for this article can be found under 'Synergy resources' at <http://www.sor.org/members/pubarchive/synergy.htm>

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follow-up a poster presentation with a manuscript. Guidance on how to achieve this is available elsewhere¹⁴.

Posters themselves can be very useful beyond the confines of a conference. They can be hung up in an office or laboratory in the workplace and serve as a showcase for any visitors. When showing people round, eg, potential collaborators, candidates for job interviews or senior management, posters can be used to give people a quick and concise summary of the type of work that is being done by the researchers in the department.

Conclusion

Poster presentations are an excellent developmental tool for disseminating research findings and communicating data. A well planned and smartly designed poster will help to convey a clear message, with the key difference from other media shaped by the need to be concise. There is not much space on which to write content and an audience will have only limited time to read what is written.

The guidance given here should make life easier for the author, thereby reducing the risk of a last-minute dash to the printers and ensuring an enjoyable experience. It is hoped that this article will inspire potential authors and also invigorate readers to visit poster sessions at conferences and appreciate the effort put in by the presenters.